



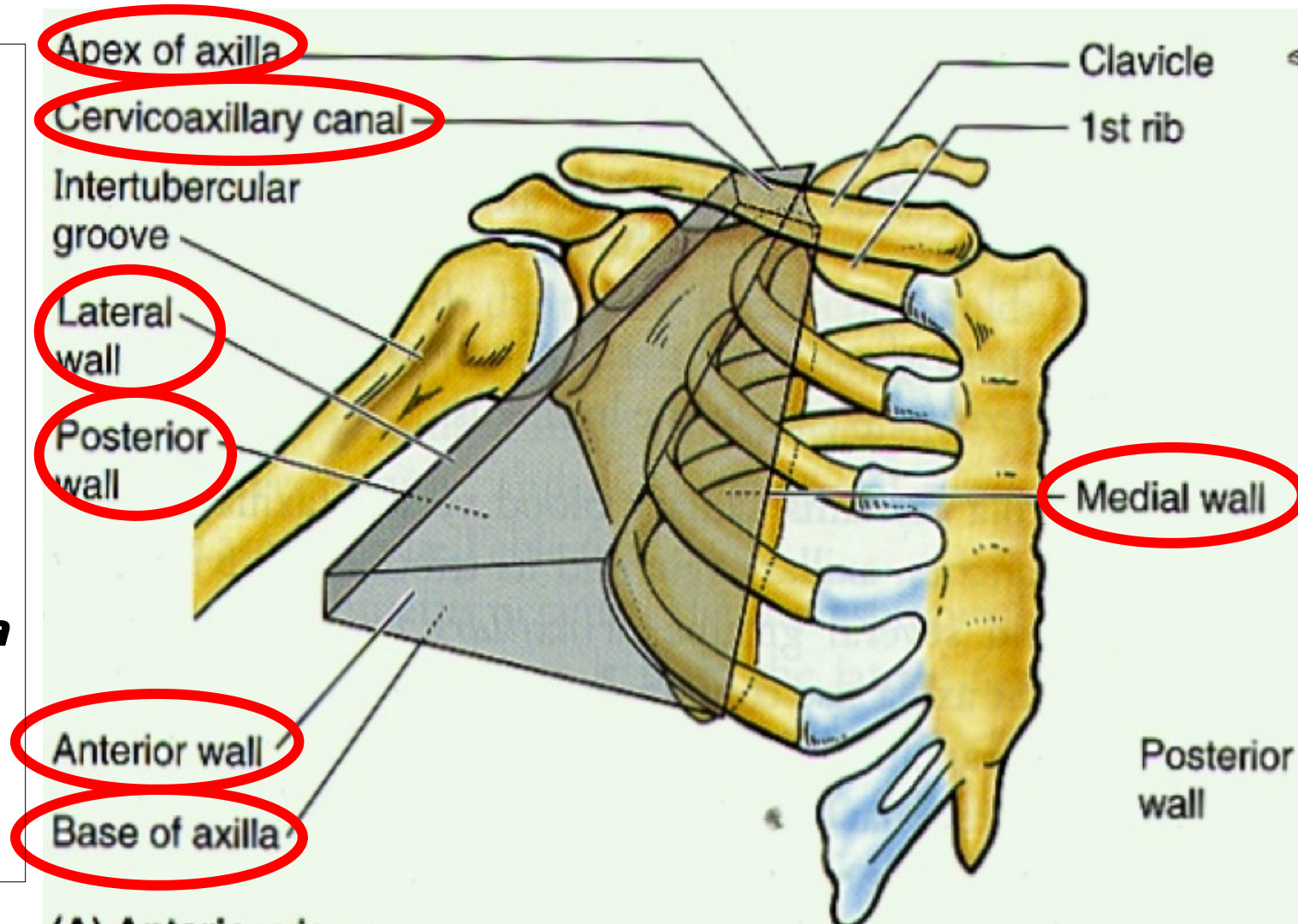
Armed Forces College of Medicine AFCM



Anatomy Remediation

Boundaries of Axilla:

***4 sided
pyramidal
space
between
upper part
of thoracic
wall &
medial side
of arm
Apex :
cervicoaxilla
ry canal
Base :
axillary
fascia***

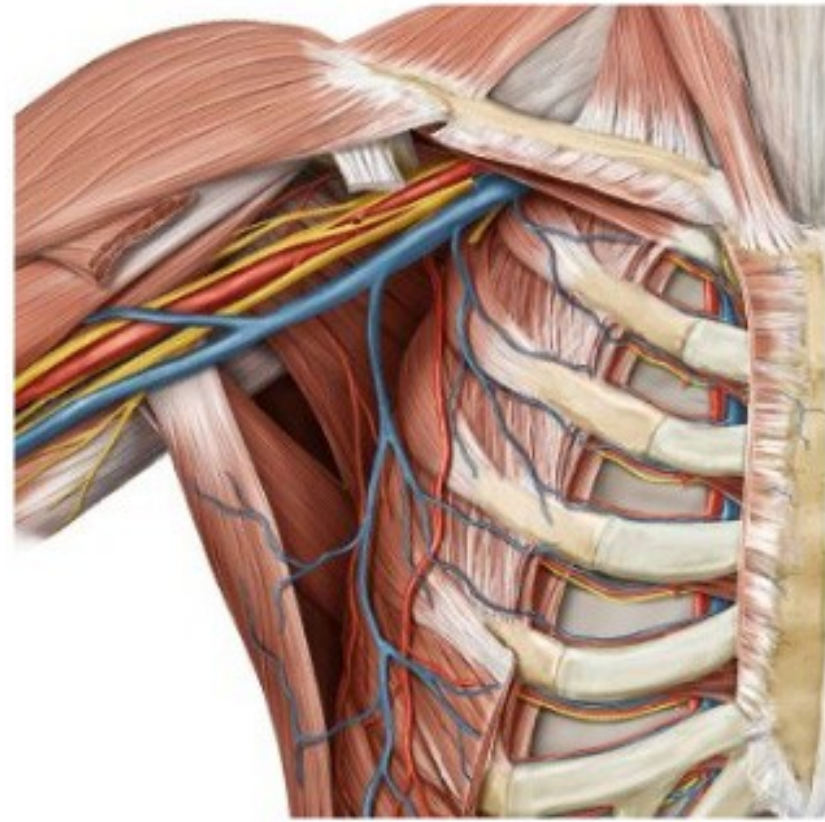


Boundaries of Axilla

- **Anterior wall** : pectoralis major, minor , subclavius and clavipectoral fascia
- **Posterior wall** :subscapularis , latissimus dorsi and teres major
- **Lateral wall** : humerus , biceps and coracobrachialis
- **Medial wall** : serratus anterior , upper 4 ribs and intercostal muscles

Contents of axilla

1. **Axillary** artery & its branches
2. **Axillary** vein & its tributaries
3. Cords of brachial plexus & their brs
4. **Axillary** L.N.
5. **Axillary** tail of breast
6. **Intercostobrachial** (lateral cutaneous br of T2) & **long thoracic nerve**
7. **Axillary** fat



*Frank H. Netter
Atlas of Human Anatomy
6th edition*

Axillary artery



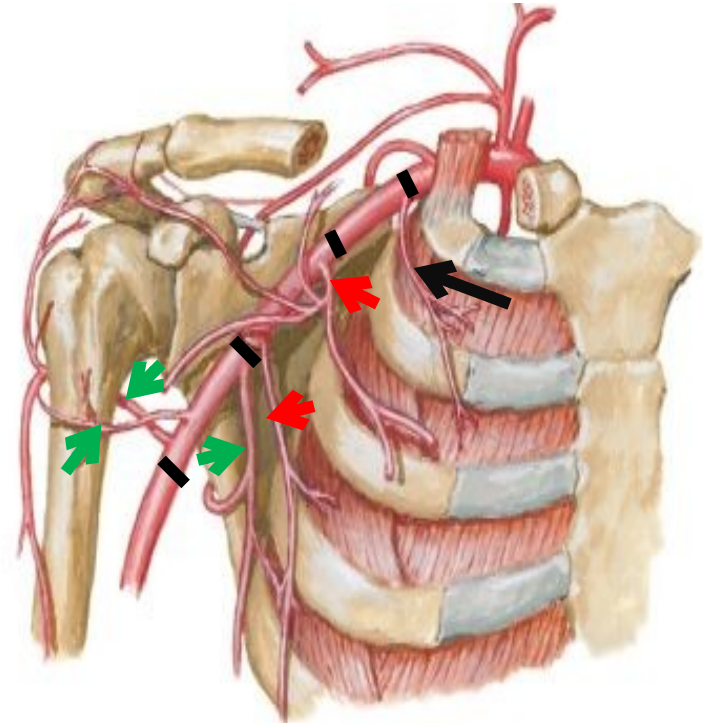
Direct continuation of subclavian at
outer border of first rib ends at
lower border of teres major

Branches of axillary artery :

First part: (one branch)
(superior thoracic artery)

Third part (three branches)

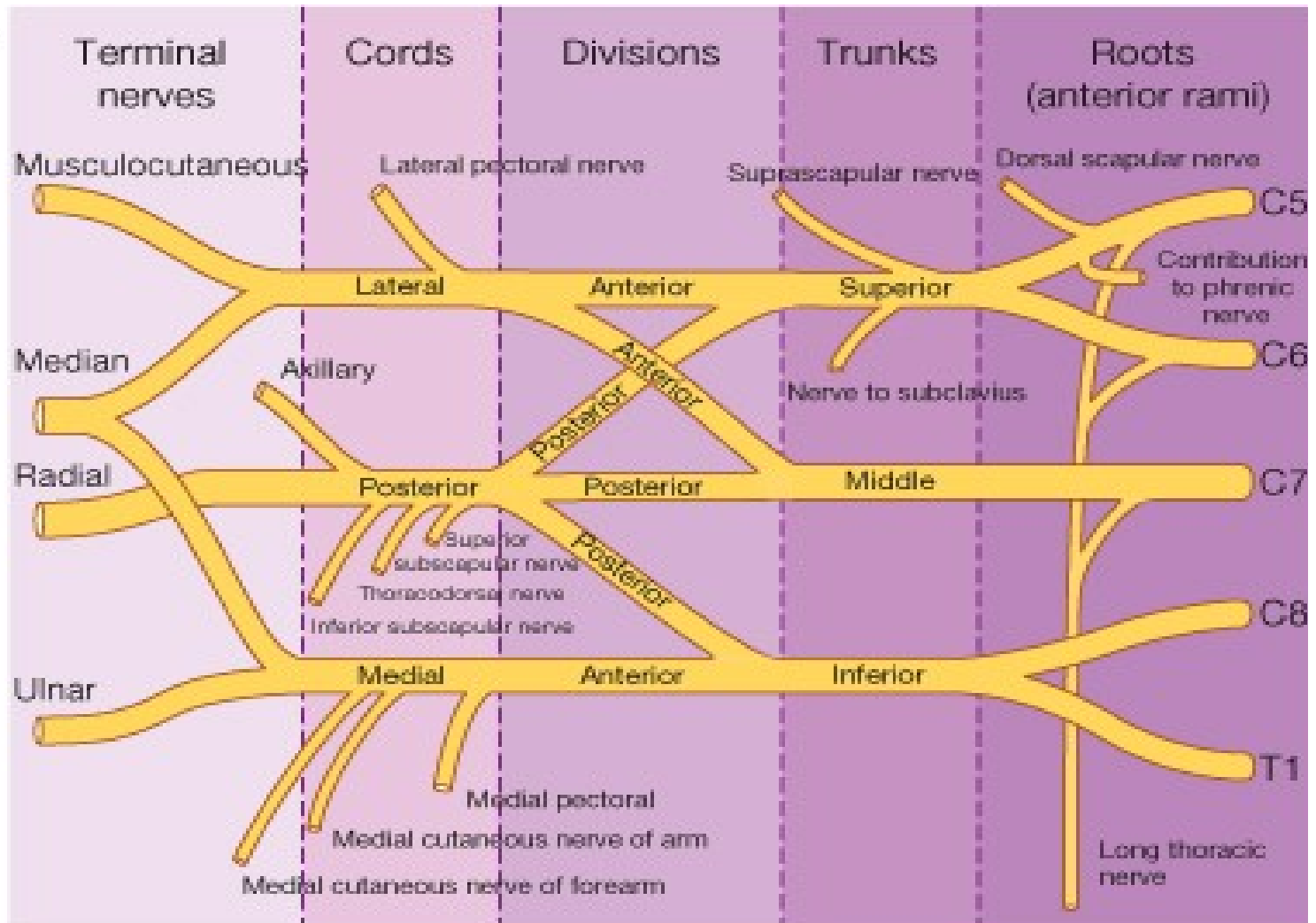
- 1-Subscapular artery.
- 2-Ant. Circumflex A.
- 3-Post. Circumflex A.



Frank H. Netter. 4th edition

Brachial Plexus

A



Branches of brachial plexus

- **Roots** : dorsal scapular and long thoracic
- **Upper trunk** : nerve to subclavius and suprascapular
- **Lateral cord** : lateral pectoral , lateral root of median nerve , musculocutaneous
- **Medial cord** : medial pectoral , medial root of median nerve , medial cutaneous nerve of arm and forearm and ulnar nerve
- **Posterior cord** : upper and lower subscapular , nerve to latissimus dorsi , axillary and radial nerve

Movements of shoulder joint (ball and socket)

- **Flexion:** by muscles **anterior** to the joint like **pectoralis major, coracobrachialis** and **anterior fibers of deltoid**.
- **Extension:** by muscles **posterior** to the joint like **latissimus dorsi, teres major** and **posterior fibers of deltoid**.
- **Abduction:** by muscles **superior** to the joint. Movement is **initiated** by **supraspinatus** then **completed** by **deltoid**.

Abduction of the arm:

Supraspinatus \square $0^{\circ} - 15^{\circ}$,
at **shoulder joint**.

Deltoid (middle fibers) \square
 $15^{\circ} - 90^{\circ}$, at **shoulder joint**.

**Trapezius & lower
digitations of serratus
anterior** \square $90^{\circ} - 180^{\circ}$,
at **shoulder girdle**.



<https://lh3.googleusercontent.com/SuNWP1VprCafc89NZ>

Adduction: by the **two climbing muscles** which are pectoralis major and latissimus dorsi.

Medial rotation: by **muscles inserted into the bicipital groove** which are pectoralis **major**, latissimus dorsi and teres **major** .

Lateral rotation: by **muscles attached to the greater tuberosity** which are **infraspinatus** and **teres minor**.

Movements of elbow joint

Hinge

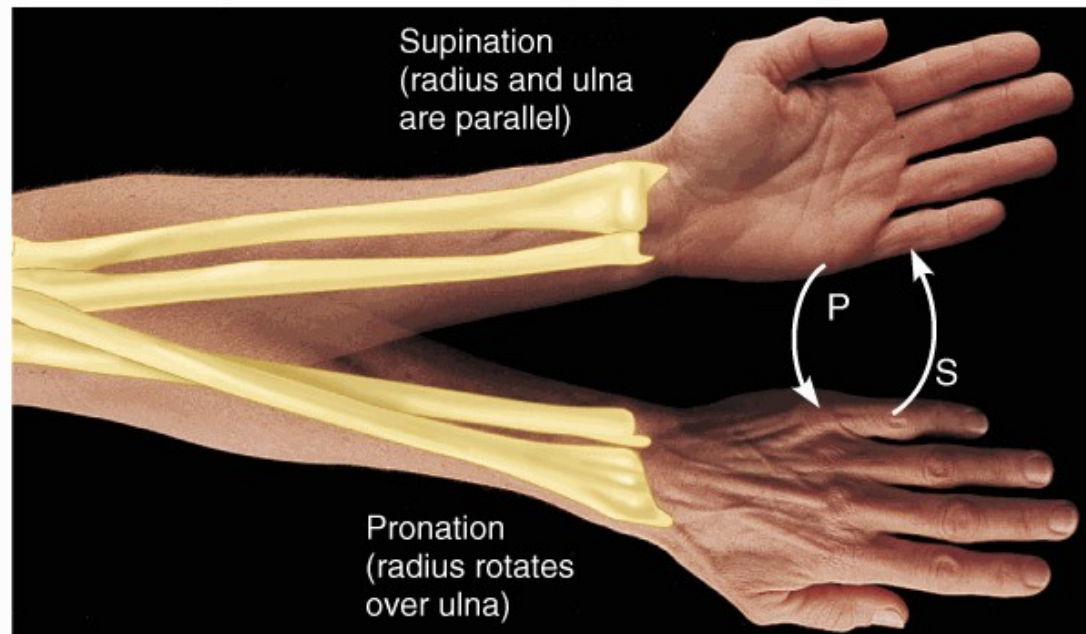
- Uniaxial joint which permits **only flexion & extension**
- **Flexion** is carried by □ biceps, brachialis & brachioradialis
- **Extension** is carried by □ triceps & anconeus



<https://lh3.googleusercontent.com/shN4xraT0LDcQsuA9D20JTs>

Movements of radio-ulnar Joints superior radioulnar (pivot)

- ❑ **Pronation** ❑ done by
pronator teres &
pronator quadratus
- ❑ **Supination** ❑ done by
 - * Supinator in extended elbow
 - * Biceps in flexed elbow
 - * Brachioradialis initiates both pronation & supination



Movements of wrist joint (ellipsoid)

Movement	Muscle producing it
Flexion	Flexor carpi radialis, flexor carpi ulnaris, palmaris longus, flexor digitorum superficialis, flexor digitorum profundus, flexor pollicis longus
Extension	Extensor carpi radialis longus & brevis, extensor carpi ulnaris, extensor digitorum, extensor digiti minimi, extensor indicis & extensor pollicis longus
Adduction	Flexor carpi ulnaris & extensor carpi ulnaris
Abduction	Flexor carpi radialis & extensor



Median nerve

- It is the main nerve of the flexors of the forearm, its root value is **C5,6,7,8,T1**.
- It arises by two roots: **lateral root** from lateral cord and **medial root** from medial cord.
- The nerve enters the forearm by passing between the two heads of pronator teres

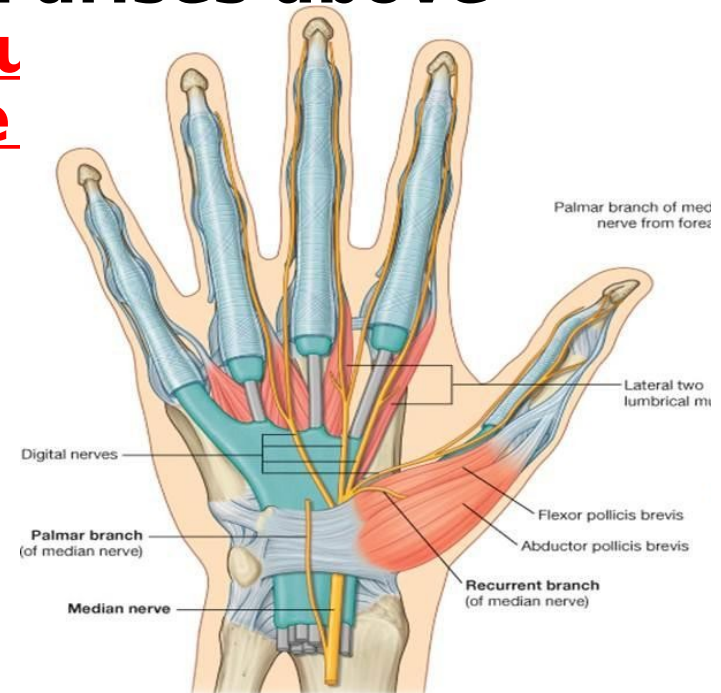


It has **no branches** in the arm.

It gives **muscular branches** to all superficial flexors of the forearm except flexor

Branches:

- The **anterior interosseous nerve** descend with the corresponding artery ,and it supplies the lateral $\frac{1}{2}$ of the flexor digitorum profundus ,flexor pollicis longus and pronator quadratus .
- **Palmar cutaneous branch:** it arises above the flexor retinaculum and supplies the lateral Median Nerve Area of sensation the palm of the



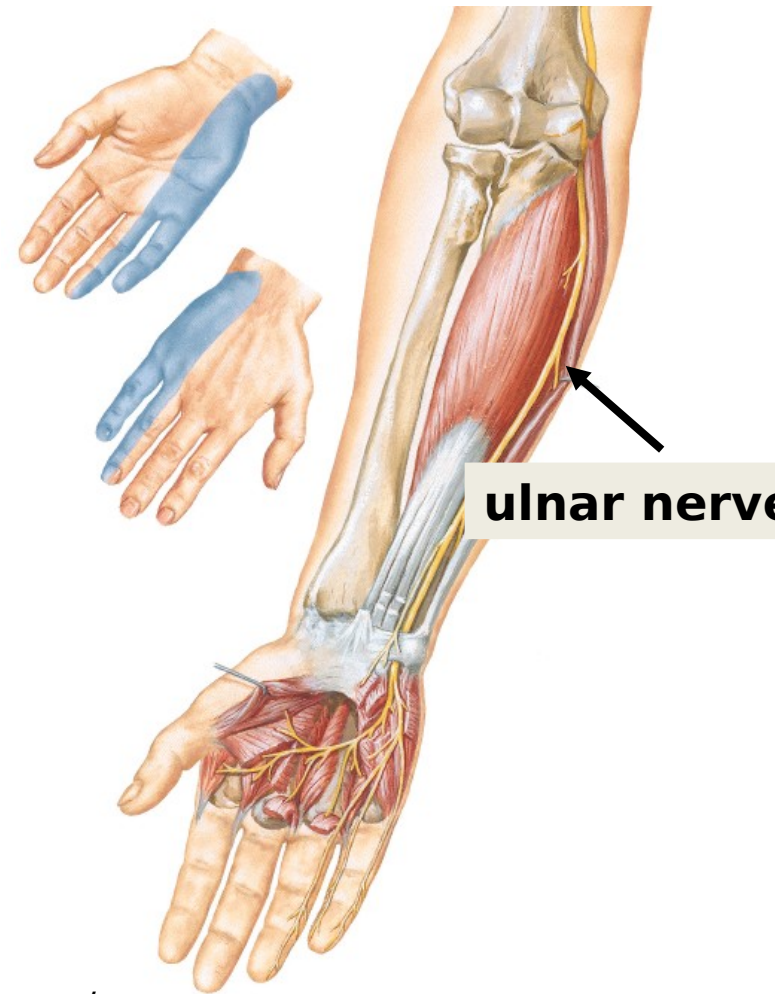
Median nerve in hand

- Muscular to thenar muscles
(abductor pollicis brevis , flexor pollicis brevis opponens pollicis
- Digital to palmar surface of lateral three and half fingers and dorsum of terminal and middle phalanges
- 2 lumbricals



The ulnar nerve

- It is the main nerve supplying most of the small muscles of the hand, its root value is C7,8,T1.
- Near the wrist, the ulnar nerve becomes superficial and pass superficial to the flexor retinaculum.
- It ends in the hand by dividing into superficial



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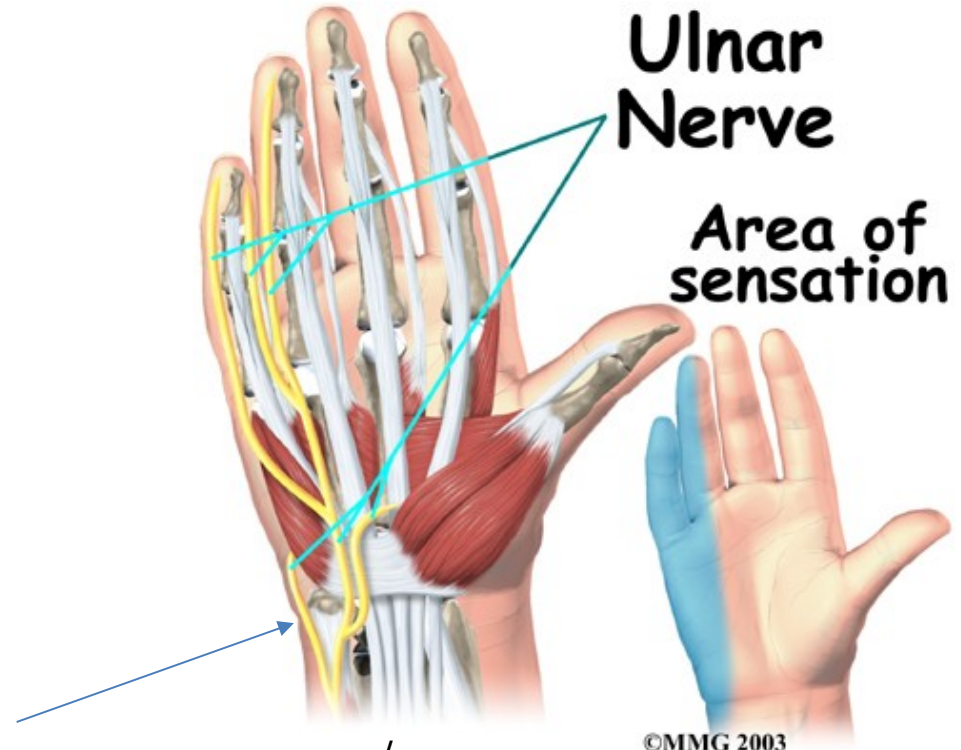
It gives no
branches in the
arm .

**Branches in
forearm & hand:**
**Two muscular
branches to
flexor carpi
ulnaris and
medial 1/2 of the
flexor digitorum
profundus.**

**Two cutaneous
branches:**

Palmar

cutaneous nerve



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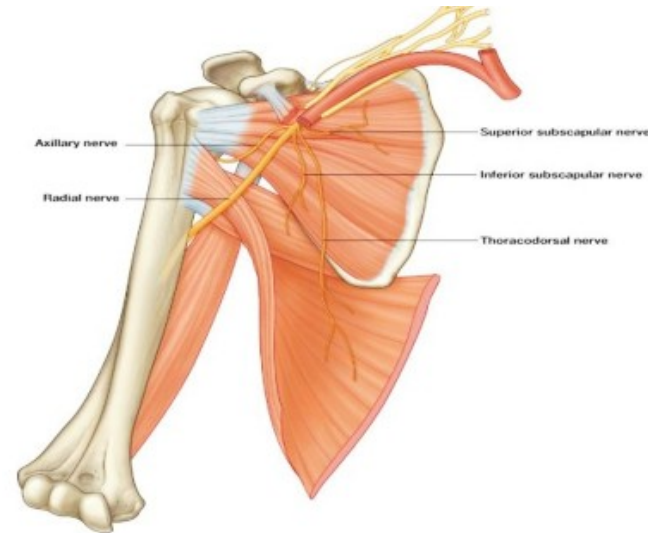


Radial Nerve

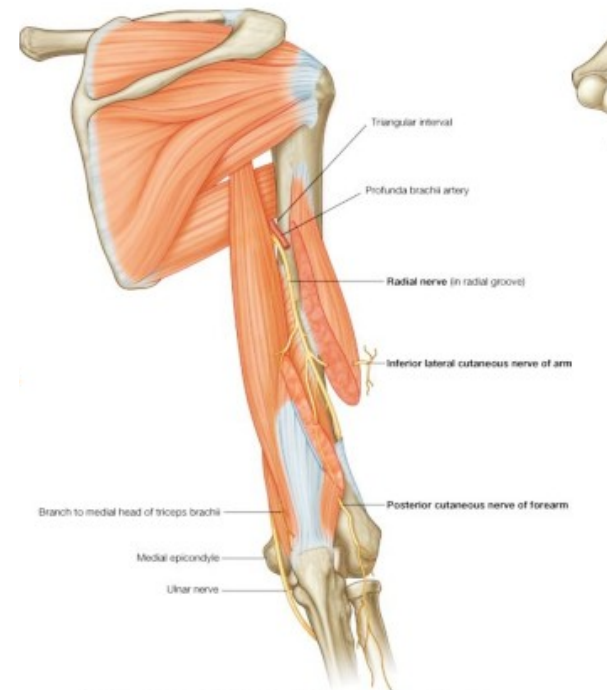
Ventral rami of C 5,6,7,8 T1 from posterior cord

Lies behind 3rd part of axillary artery.

- Passes **between long and medial heads of triceps** with profunda (in lower triangular)
- Passes in **spiral groove**
- Pierces **lateral intermuscular septum** to reach anterior compartment
- Passes between **brachialis** and **brachioradialis**



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Branches of radial nerve

- **In axilla**

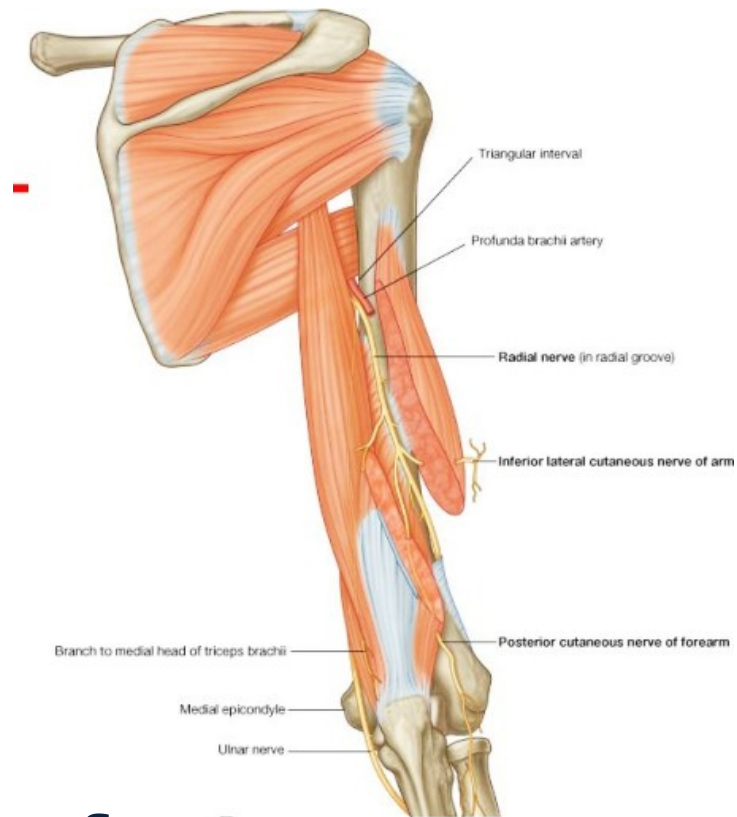
- 1- **long** head of **triceps**
- 2- **Medial** head of **triceps**
- 3- **Posterior cutaneous nerve of arm**

- **Branches in spiral groove**

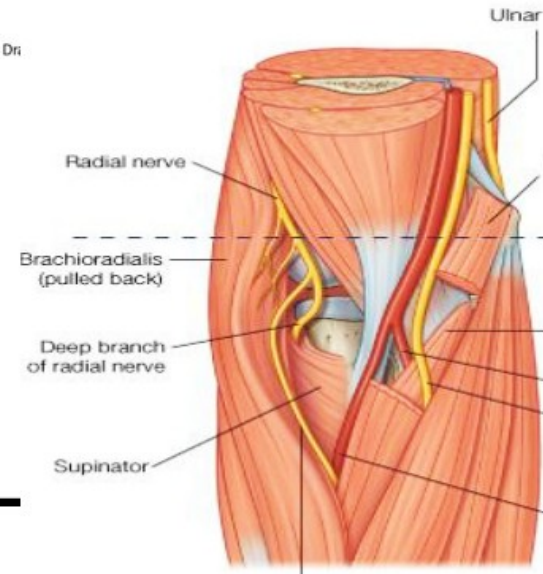
- 1- **Lateral** head of **triceps**
- 2- **Medial** head of **triceps**
- 3- nerve to **anconeus**
- 4- **Lower lateral cutaneous nerve of arm**
- 5- **Posterior cutaneous nerve of forearm**

- **Branches in groove between brachialis & brachioradialis**

- 1- Lateral part of **brachialis**
- 2- **Brachioradialis**



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Brachial artery

Direct continuation of axillary ends at neck of radius

Branches of brachial artery

- **Muscular**
- **Nutrient** to humerus
- **Superior ulnar collateral:**

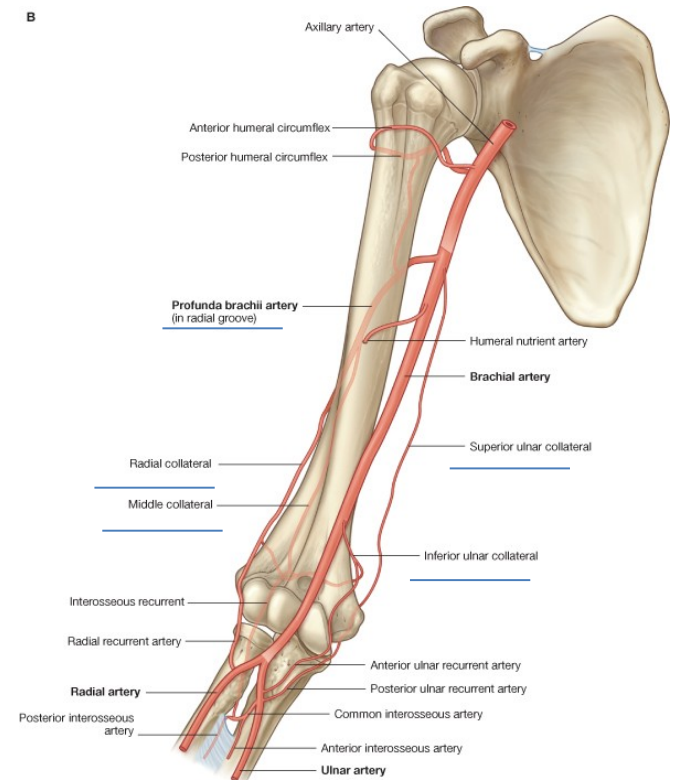
Arises at middle of arm, passes to back of medial epicondyle

- **Inferior ulnar collateral :**
 - arises 2 inches above elbow divides into 2 branches
 - passes anterior & posterior to medial epicondyle

Profunda brachii

Branches :

- ☐ **Muscular** to triceps
- ☐ **Ascending branch** : anastomose with descending of posterior circumflex
- ☐ **Nutrient** to humerus
- ☐ **Anterior descending branch** : to front of

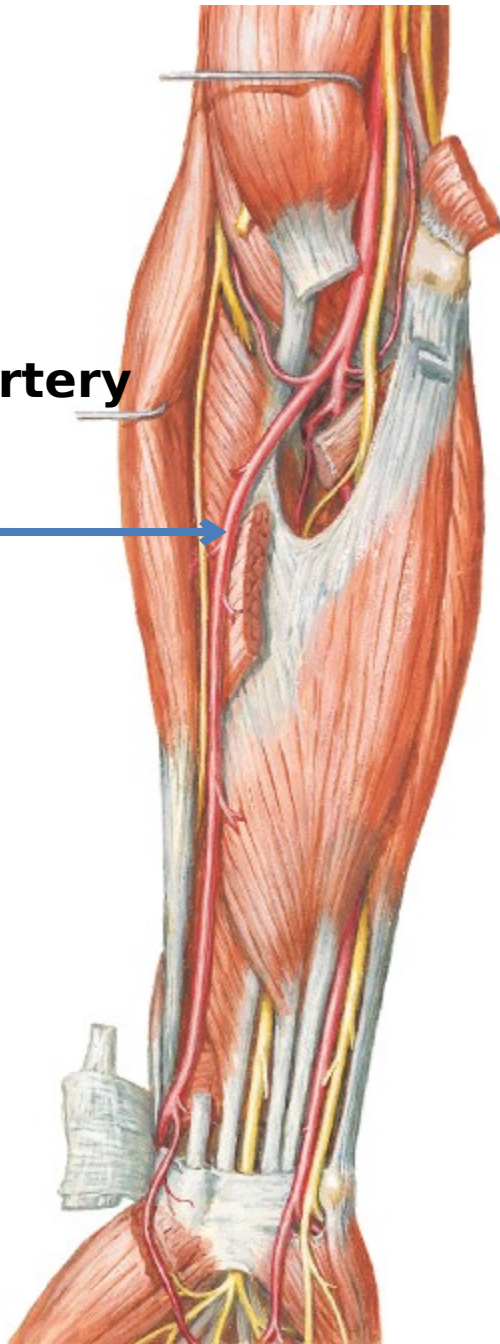


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Radial artery

- Terminal branch of brachial
- Starts at level of neck of radius
- Passes on lateral side of forearm lateral to tendon of flexor carpi radialis (site of pulse)
- Passes in floor of anatomical snuff box
- Covered by Brachioradialis
- Radial nerve is lateral in middle of forearm

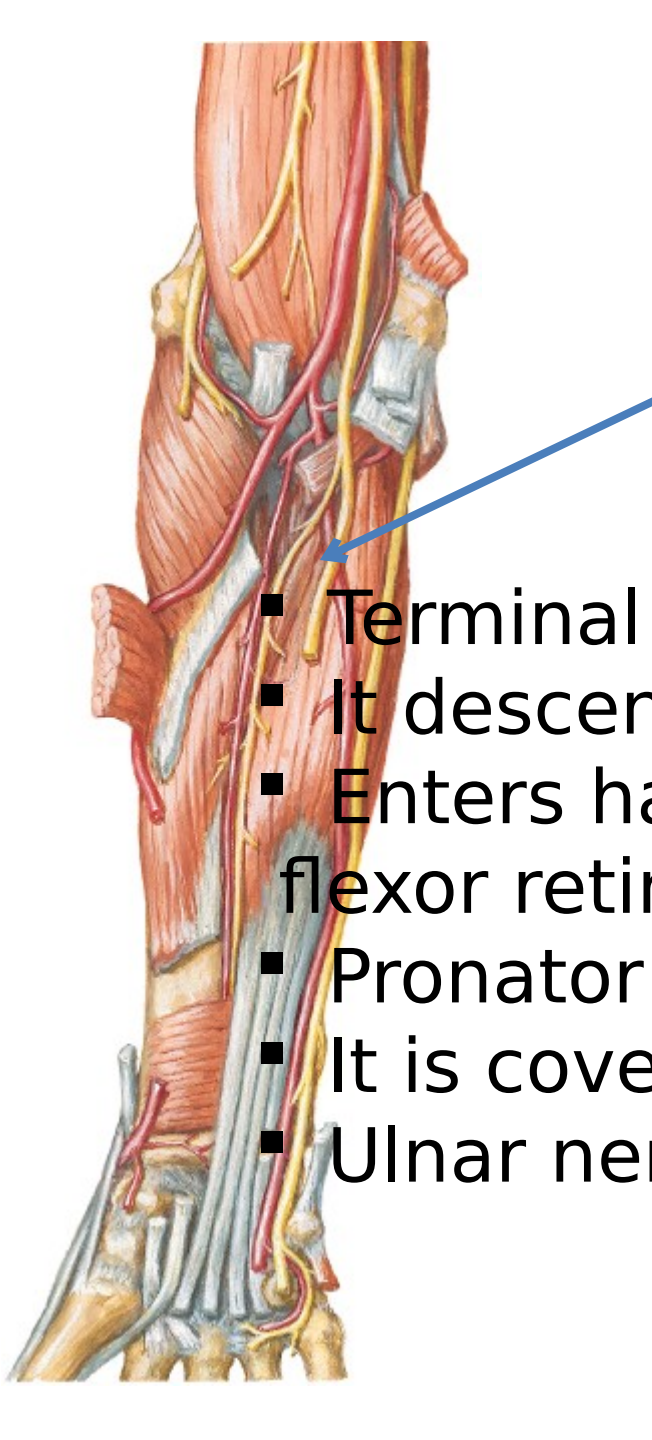
Radial artery



Branches of radial artery

- 1- radial recurrent
shares in anastomosis
around elbow
- 2- muscular
- 3- anterior carpal
- 4- superficial palmar

Ulnar artery

- 
- Terminal branch of brachial artery
 - It descends on medial side of forearm
 - Enters hand by passing superficial to flexor retinaculum
 - Pronator teres separates it from median n
 - It is covered by flexor carpi ulnaris
 - Ulnar nerve is medial in lower part

Branches of ulnar artery

1- muscular

2- anterior ulnar recurrent

3- posterior ulnar recurrent



anastomosis elbow

4- **common interosseous which divides into**

A- anterior interosseous artery passes in front of interosseous membrane gives nutrient to radius and ulna, descending branch to anterior carpal

B- posterior interosseous gives, interosseous recurrent (anastomosis around elbow) anterior carpal and posterior carpal

Cubital fossa

Definition : Triangular intermuscular space in-front of elbow

Boundaries:

- ❑ **Medial**: lateral border of pronator teres
- ❑ **Lateral**: medial border of brachioradialis
- ❑ **Base** : imaginary line between 2 epicondyles
- ❑ **Apex**: overlap between pronator teres & brachioradialis
- ❑ **Floor**: lateral supinator & medial brachialis
- ❑ **Roof** :
 - Skin
 - Superficial fascia containing cephalic vein; basilic vein & median cubital vein
 - Deep fascia & bicipital aponeurosis

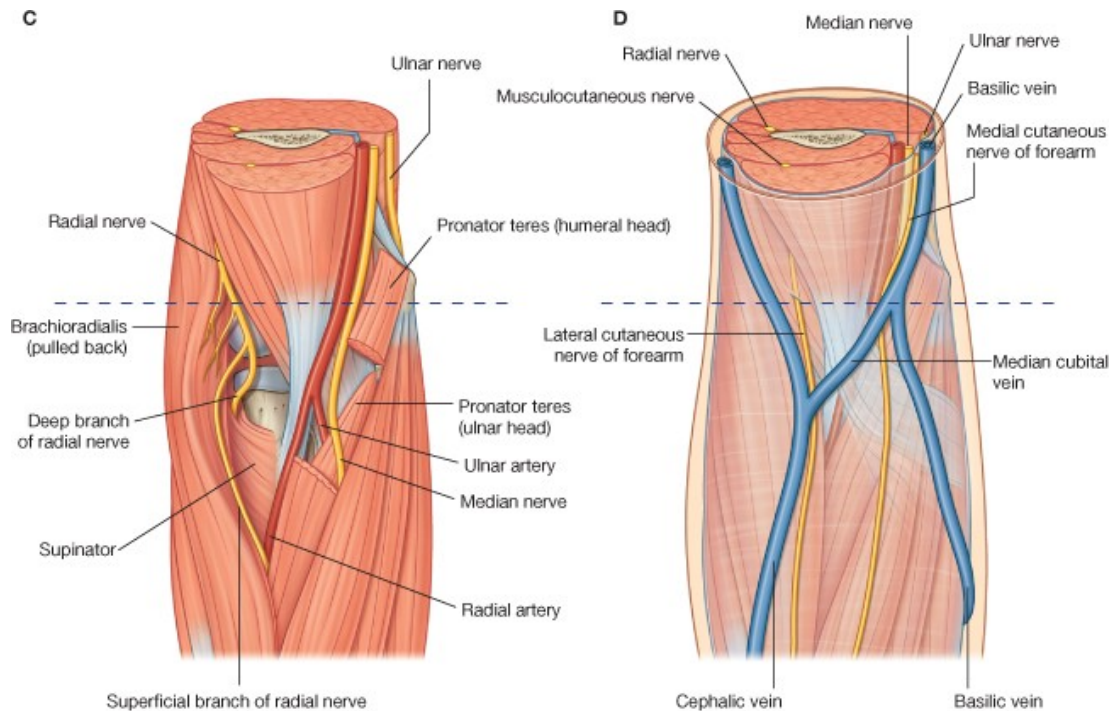
Contents

Brachial artery : lies in middle of fossa, divides into

- 1-ulnar artery leaves fossa by passing deep to pronator teres
- 2- radial artery leaves fossa at its apex under brachioradialis

- **Median nerve** : on medial side of artery leaves fossa By passing between **2 heads of pronator teres**
- **Tendon of biceps** : on lateral side of brachial artery
- **Radial nerve** : lateral between brachialis & brachioradialis

Cubital fossa

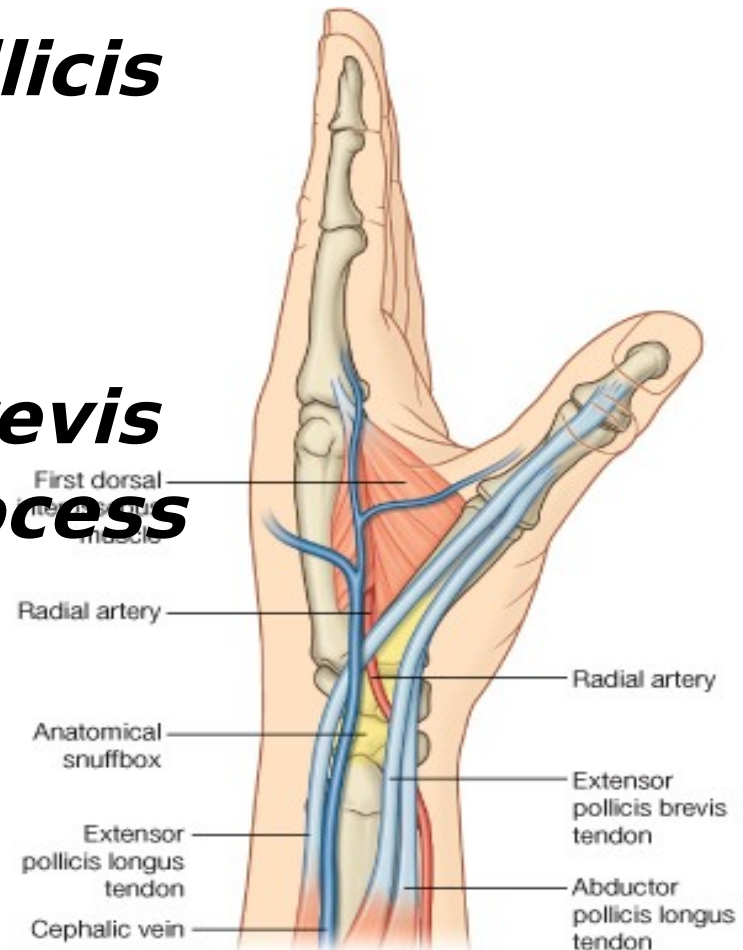


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Anatomical “snuff box”

Boundaries of Anatomical “snuff box”

- **Medial:** *extensor pollicis longus*
- **Lateral:** *abductor pollicis longus*
extensor pollicis brevis
- **Proximal:** *styloid process of radius*
- **Floor:** *scaphoid trapezium*



flexor retinaculum

is attached to the

1. Medially:

- pisiform & hook of hamate.

2. Laterally:

scaphoid & Trapezium

Structures superficial

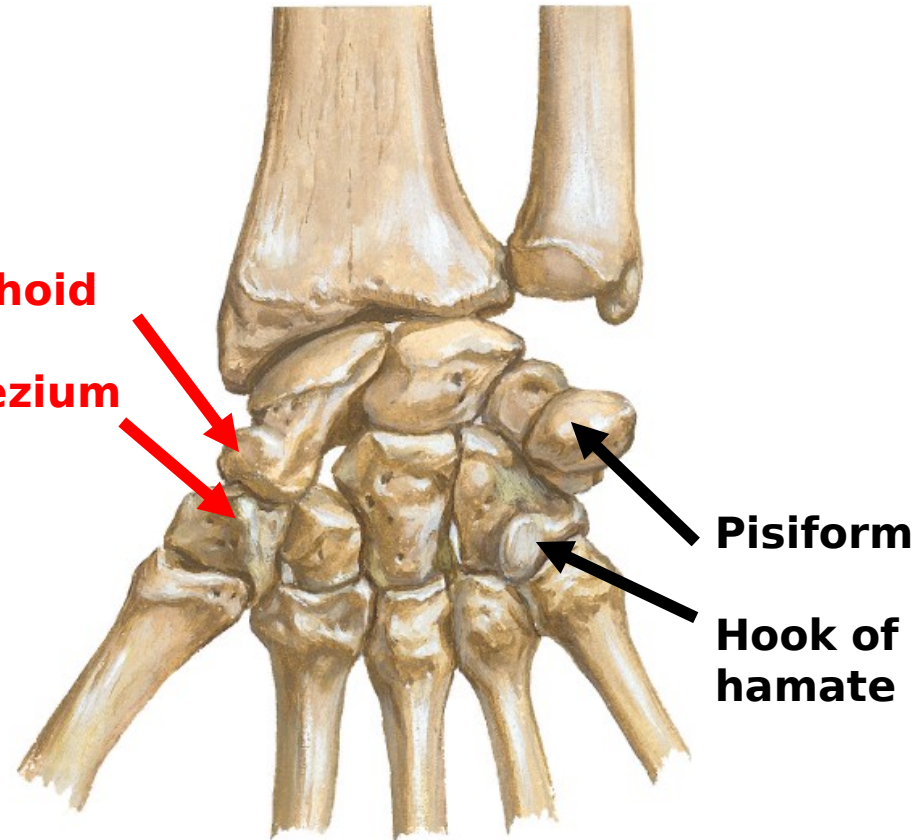
1. Ulnar nerve.
2. Ulnar vessels.
3. Palmar cutaneous branch of ulnar nerve.
4. Tendon of Palmaris longus.
5. Palmar cutaneous branch of median nerve.

Structures deep

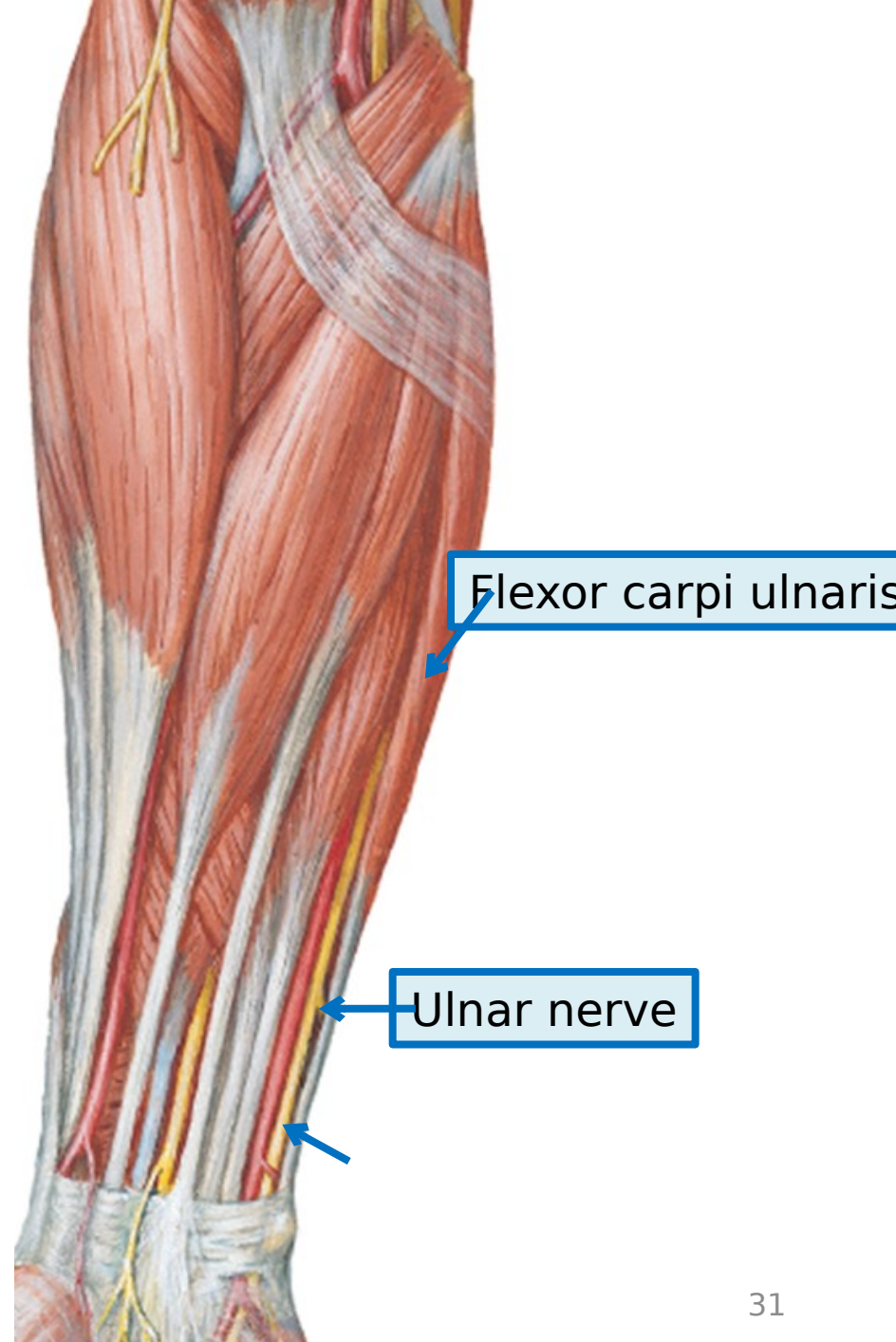
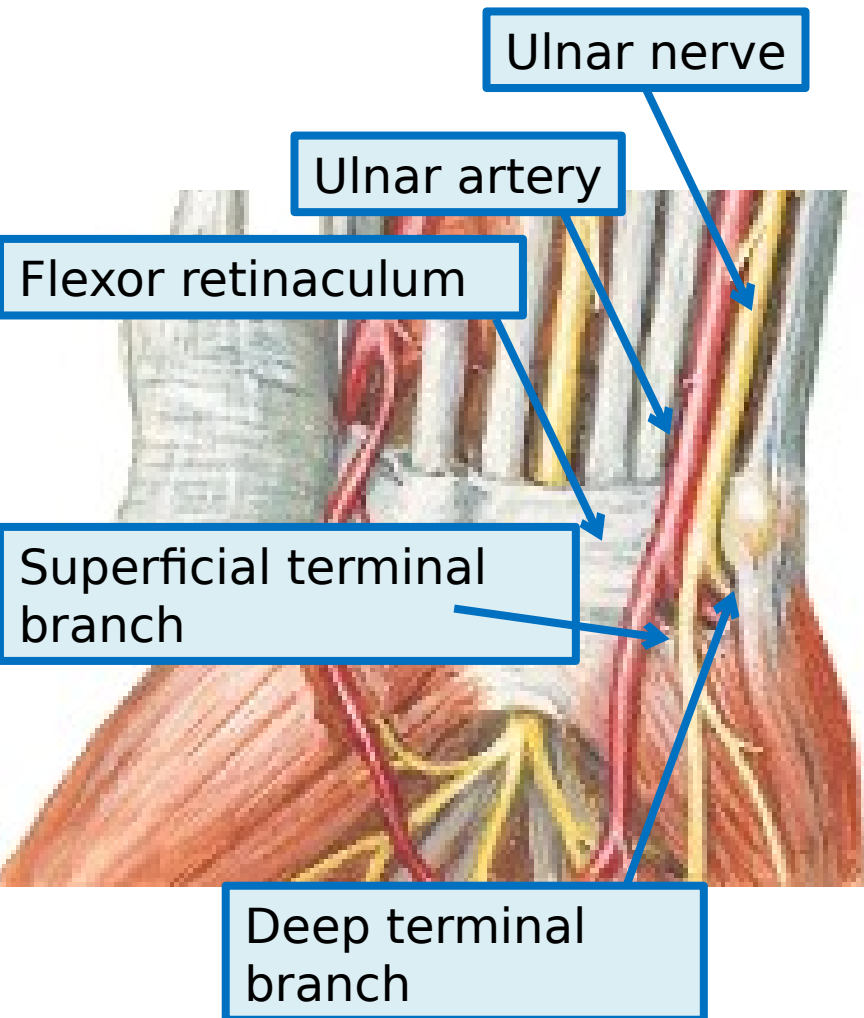
1. Median nerve

2. Tendons of flexor digitorum superficialis, profundus & their common synovial sheath
3. Tendon of flexor pollicis longus and its synovial sheath.
4. Tendon of flexor carpi radialis

Scaphoid
trapezium



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THE FEMORAL TRIANGLE

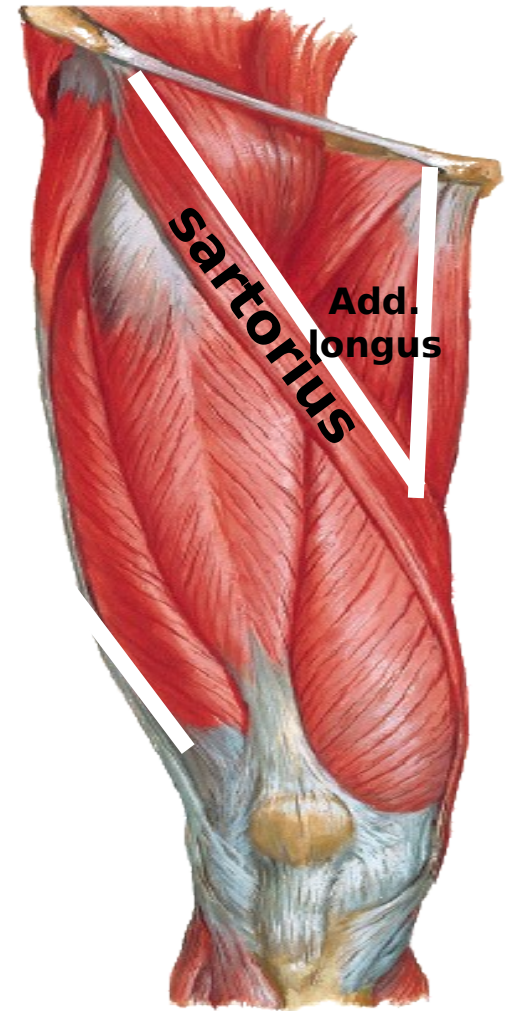
Boundaries.

- o **Lat:** Medial border of sartorius muscle.
- o **Med:** Medial border of adductor longus muscle.
- o **Base:** Inguinal ligament
- o **Apex:** meeting of medial and lateral border.

Floor:

from medial To lateral

- 1- Adductor longus m.
- 2- Pectineus muscle.
- 3- **ps**oas muscle.
- 4- Iliacus



Femoral Triangle

Contents of Femoral Triangle

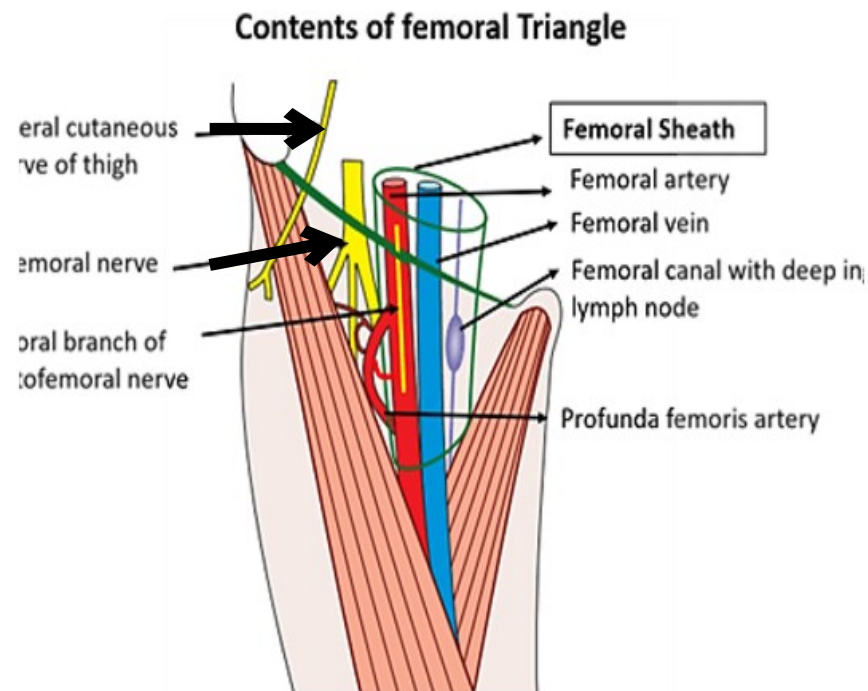
1-Femoral artery & its branches.

2-Femoral vein & its tributaries.

3-Femoral sheath?????.

4-Femoral branch of genitofemoral nerve.

5-Femoral nerve & its branches



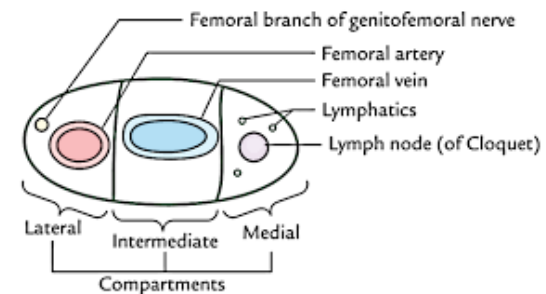
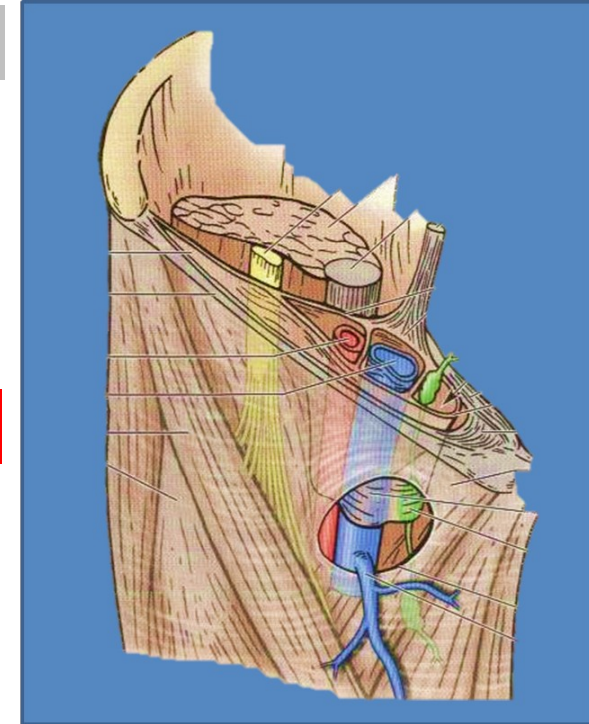
Femoral sheath:

The femoral sheath is divided by 2 septa into 3 compartments:

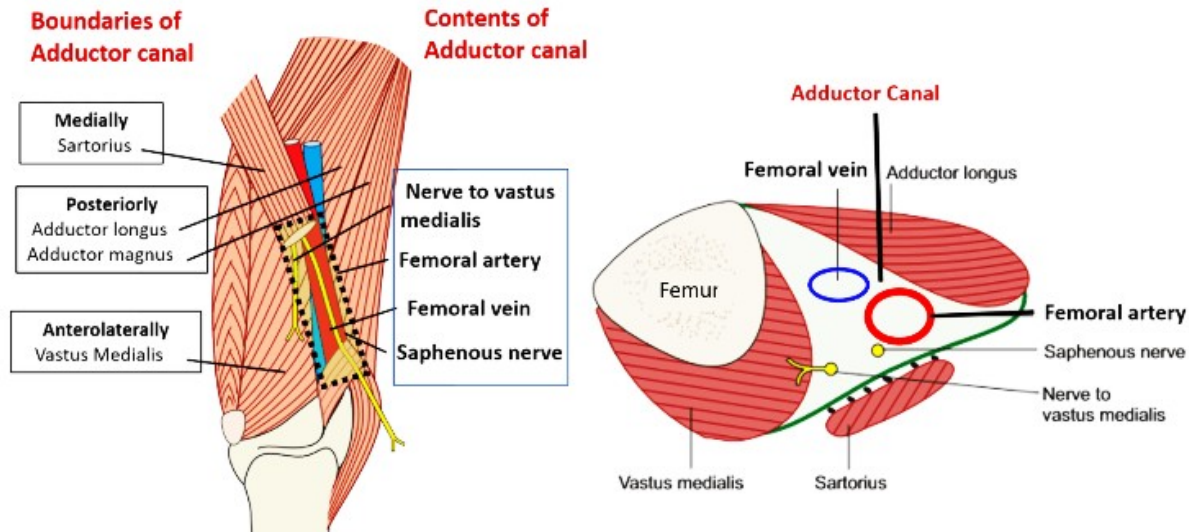
1-Lateral compartment:
contains the & the
femoral branch of genitofemoral nerve.

2-Intermediate compartment: contains
the

3-Medial compartment: is called **femoral canal**, contains fat & one lymph node.



Adductor



Boundaries:

The canal is triangular in cross section:

Anterolateral wall: Is formed by vastus medialis.

Posterior wall (floor): Is formed by adductor longus above & adductor magnus below.

Anteromedial wall (roof): Is formed by a strong fibrous (fascial) layer which extends from the vastus medialis to adductor longus and magnus

Femoral nerve:

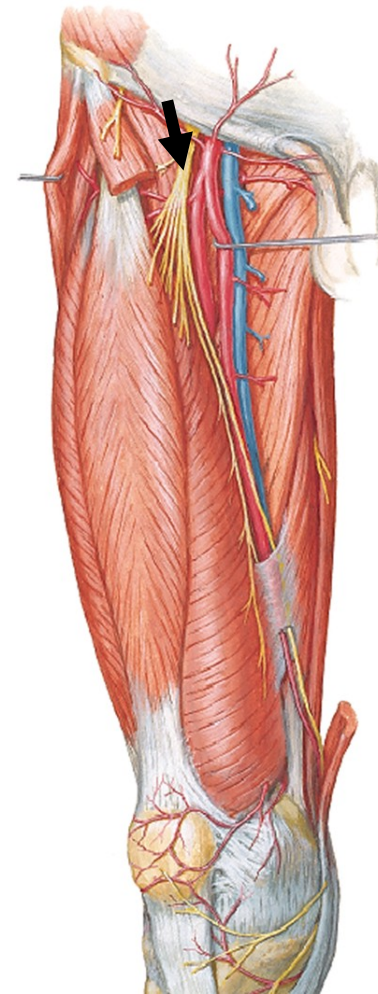
The largest branch of the **lumbar plexus** (anterior compartment of thigh).

-Arises from the dorsal divisions of the ventral rami of **L 2,3,4.**

Course :

Enters the thigh behind the **midpoint of the inguinal ligament** lateral to the femoral artery

Ends 2 inches below the inguinal ligament by dividing into anterior and posterior divisions.



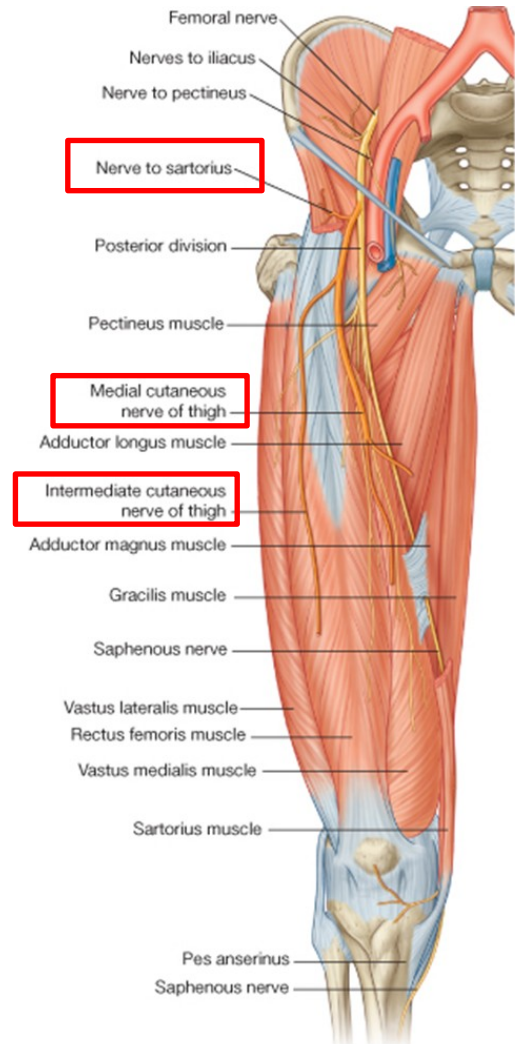
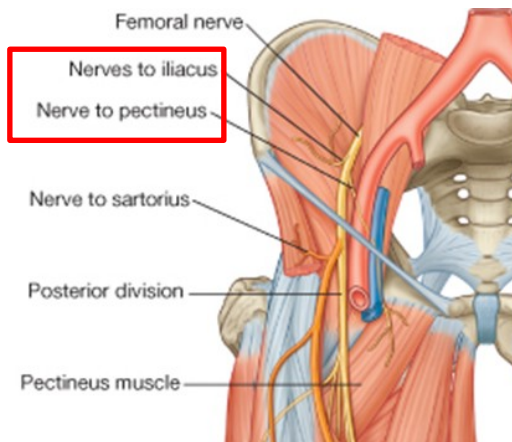
Branches:

1) Branches from the trunk.

a) Branch to **iliacus** that arises in the abdomen

b) Branch to **pectineus** that arises just below the inguinal ligament

c) Vascular branch to **femoral artery**.



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2) Branches from the anterior division:

a) **Intermediate cutaneous** nerve of the thigh.

b) **Medial cutaneous** nerve of the thigh.

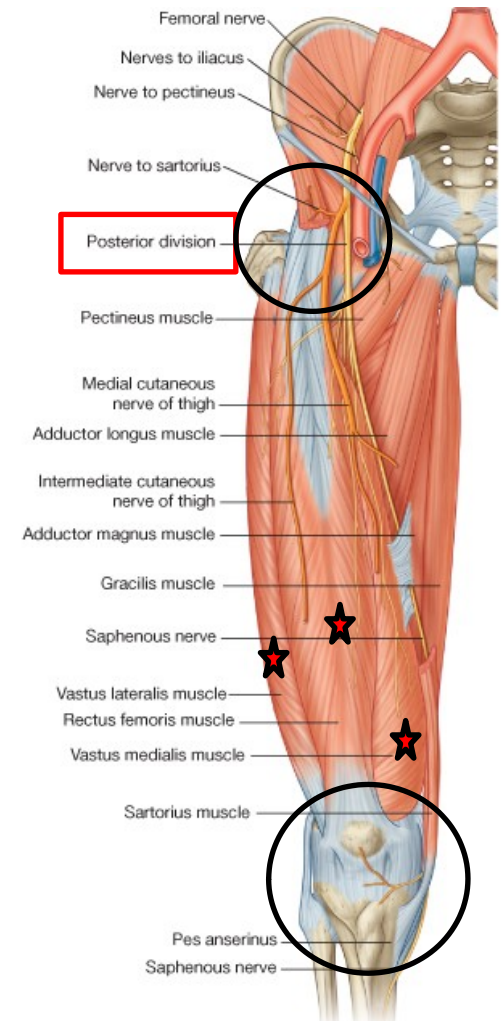
c) Nerve to **sartorius**.

3) Branches from the posterior division:

a) Muscular branches to 4 heads of quadriceps femoris.

b) Saphenous Nerve

Then descends on the **medial side of the leg** with the great saphenous vein. Finally passes in front of the medial malleolus and runs along the **medial side of the dorsum of the foot** to the metatarso-phalangeal joint of the big toe (**ball of the big toe**).



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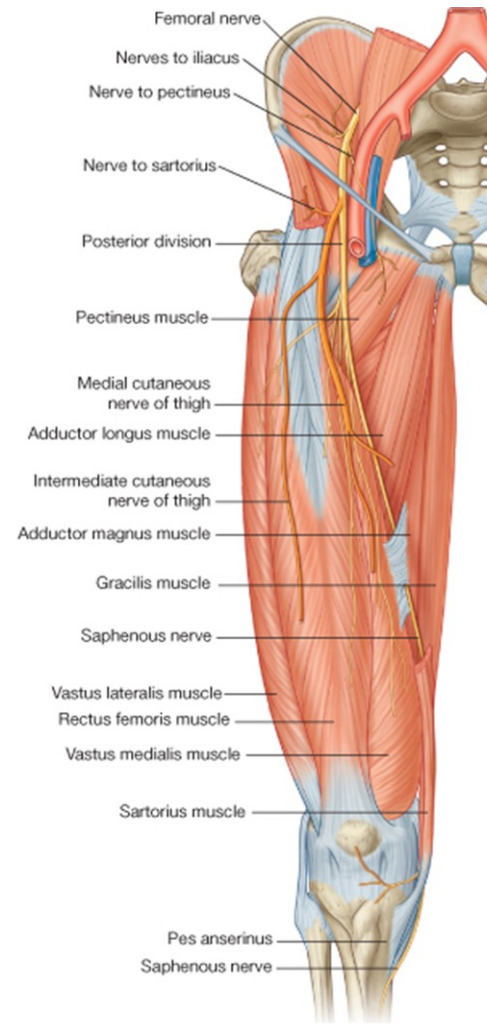
Applied anatomy:

1-The femoral nerve gives articular branches to both **hip & knee joints**, so a lesion in one joint leads to **referred pain** in the other joint.

2-Injury of the femoral nerve leads to:

a) Motor effect: paralysis of the **quadriceps femoris** muscle (knee cannot be extended).

b) Sensory effect: loss of sensation of the **anteromedial side of the thigh and the medial side of**

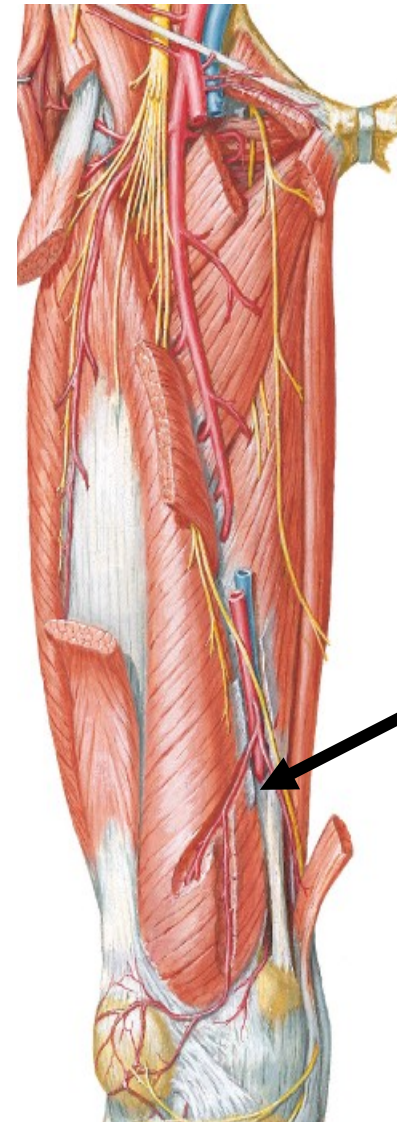
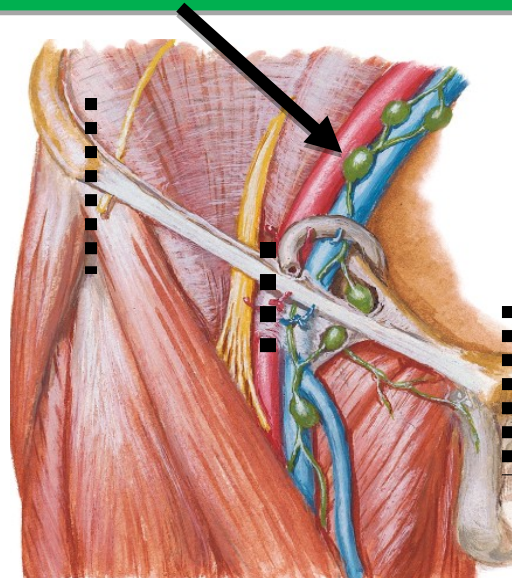


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Femoral Artery

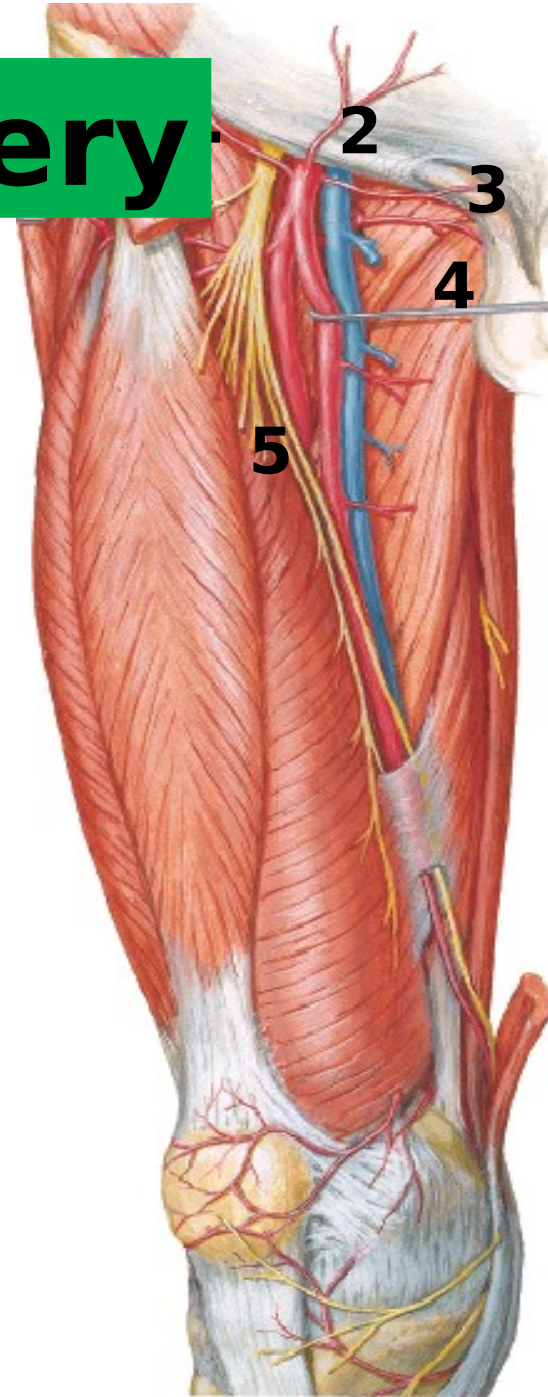
- **Begins:**
- Direct continuation of external iliac artery.
- At mid-inguinal point
- (midway between the ASIS and the symphysis pubis)
- **Ends:**
- By becoming popliteal artery.
- At the adductor hiatus at the junction of the upper 2/3 & lower 1/3 of thigh.



branches of femoral artery

Branches:

1. **Superficial** circumflex iliac artery: # around ASIS.
2. **Superficial** epigastric a.: Ant. Abdominal wall
3. **Superficial** external pudendal a.: external genital organs
4. **Deep** external pudendal a.: external genital organs
5. **Profunda femoris a.**
6. **Descending genicular a.:** from lower part of femoral a. **in adductor canal, to anastomosis around knee**



Branches of Profunda Femoris Artery

artery:

Pass laterally between divisions of femoral nerve.

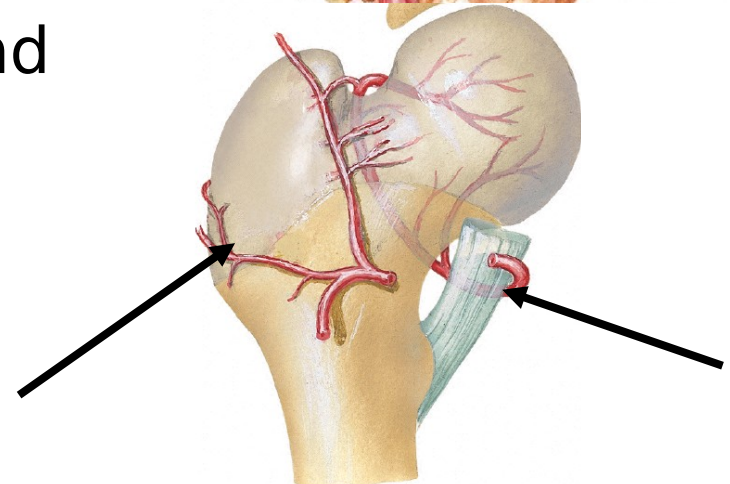
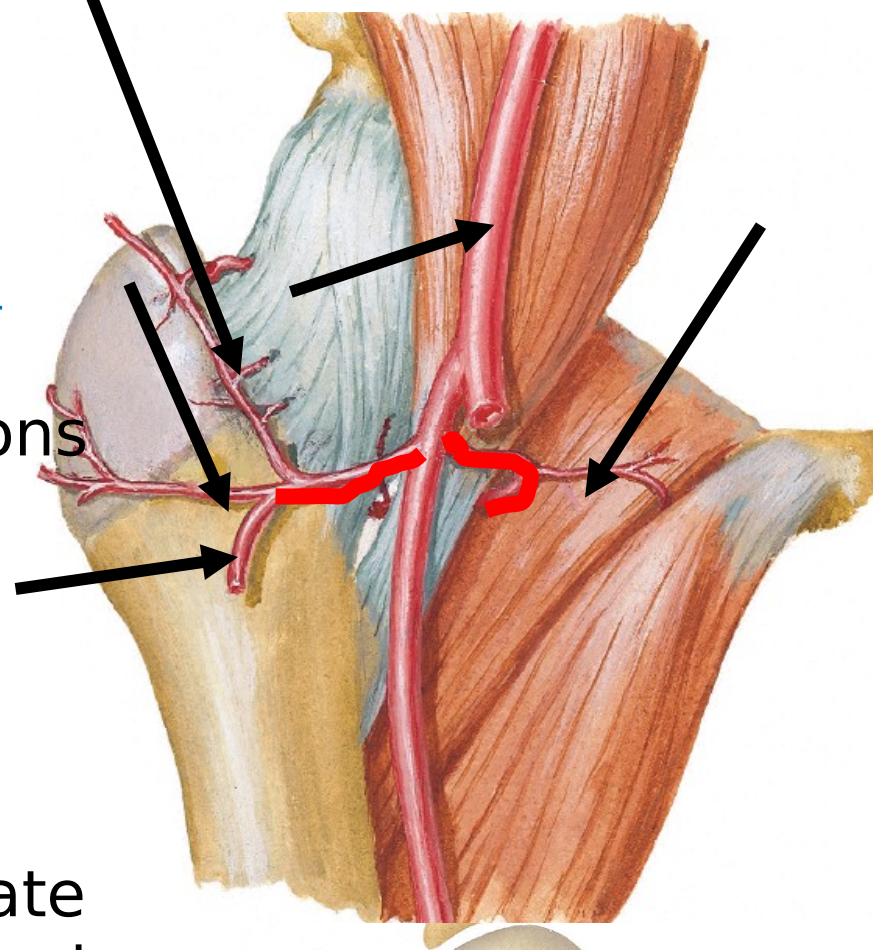
Branches:

1. Ascending branch.to # trochanteric, ASIS
2. Transverse branch .to# cruciate
3. Descending branch. To# around knee

Medial circumflex femoral artery:

Passes between pectineus & psoas major to the back of thigh

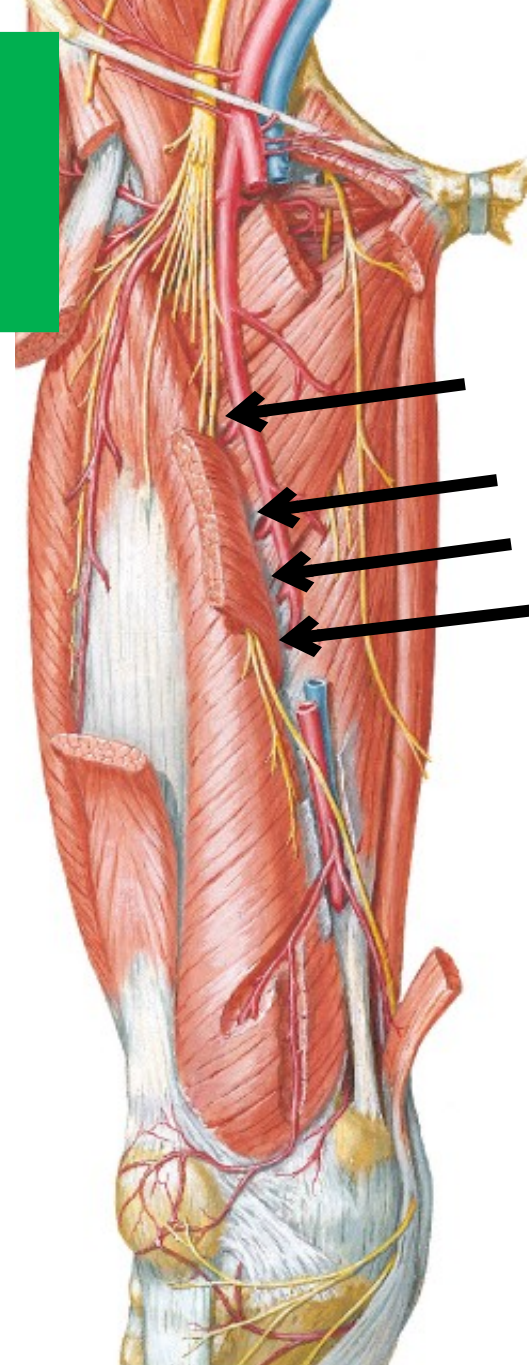
Branches:



Branches of Profunda

arteries:

- 4 in number.
 - Perforate adductor magnus.
 - Protected by tendinous arches.
 - Form chain anastomosis in the back of thigh (by ascending & descending branches).
- 1---- Cruciate anastomosis.
 - 2---- Nutrient artery of femur.
 - 4---- Continuation of profunda.

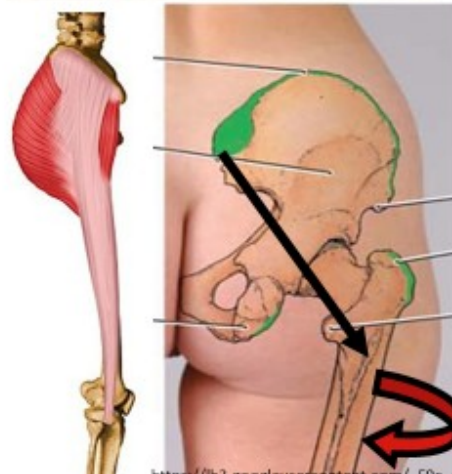
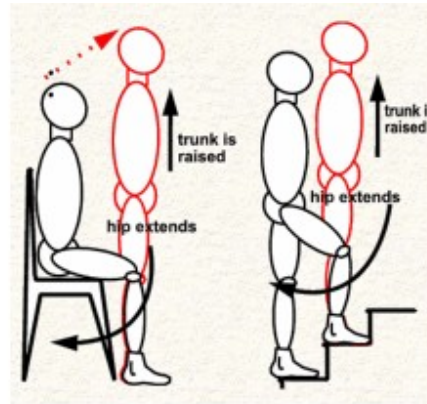


Gluteus maximus

nerve supply inferior gluteal

Action of gluteus maximus

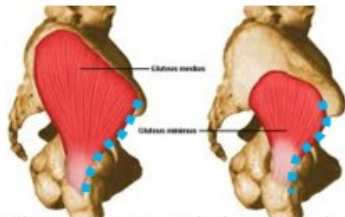
- The main & strongest **extensor** of the hip joint (essential in standing up from the sitting position, climbing up stairs and running)
- Assists in **lateral rotation** of the thigh
- Through its attachment to iliotibial tract, it **stabilizes** hip bone on femur & femur on tibia during standing to maintain the erect posture



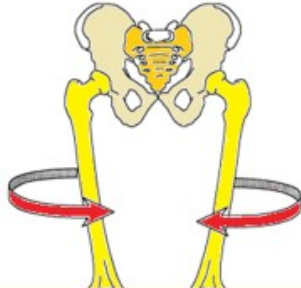
Thursday, April 8, 2021

Gluteus Medius and minimus nerve supply superior gluteal

Action of gluteus medius and minimus

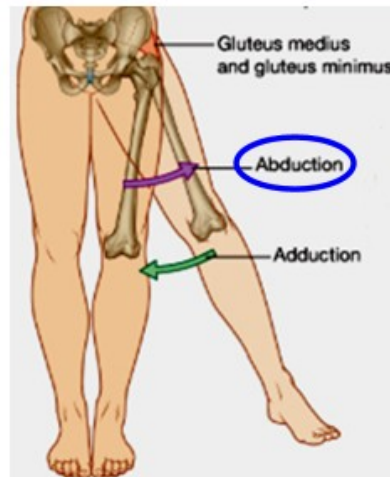


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Their anterior fibers
are **medial rotators**
of the thigh

Main abductors of the thigh



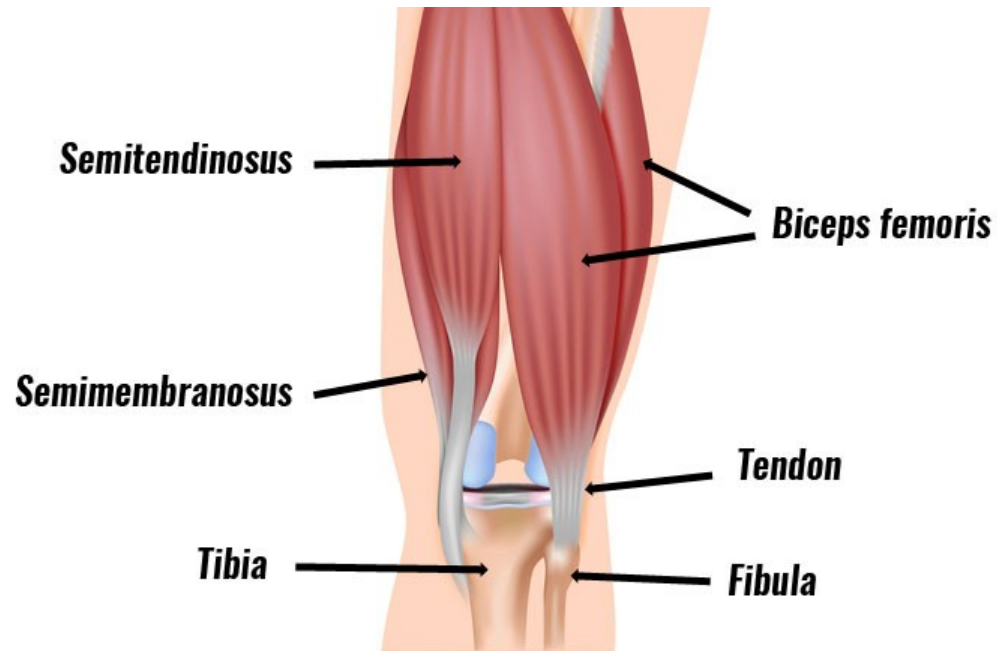
Thursday, April 8, 2021

Hamstring muscles

- ❑ Biceps , semitendinosus ,semimembranosus
- ❑ All act on both hip and knee except **short head of biceps**
- ❑ All ***extend hip*** and ***flex the knee***
- ❑ ***Biceps lateral rotation***
- ❑ ***Semitendinosus and semimembranosus medial rotation***
- ❑ All are supplied by ***sciatic nerve***
- ❑ ***Blood supply of back of thigh is via perforating arteries***

Faculty of Medicine

Hamstring muscles



Sciatic nerve

(L4,5, & S1,2,3)

The thickest nerve in the body.

Begins in the pelvis and terminates at the superior angle of popliteal fossa.

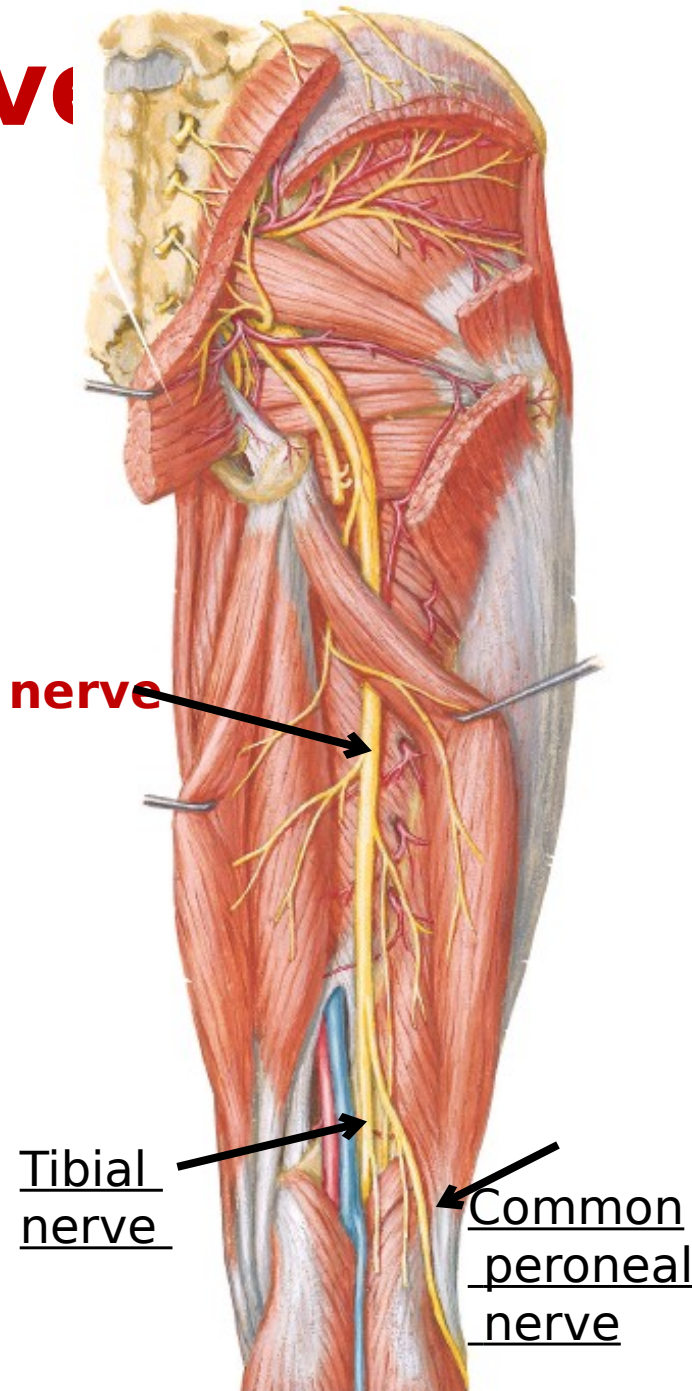
Termination: It divides into

a) Tibial nerve (ventral division of L4,5 & S1,2,3)

b) Common peroneal nerve (dorsal divisions of L4,5 & S1,2)

Branches:

a) **Articular** (hip joint) & **muscular** (hamstring muscles).

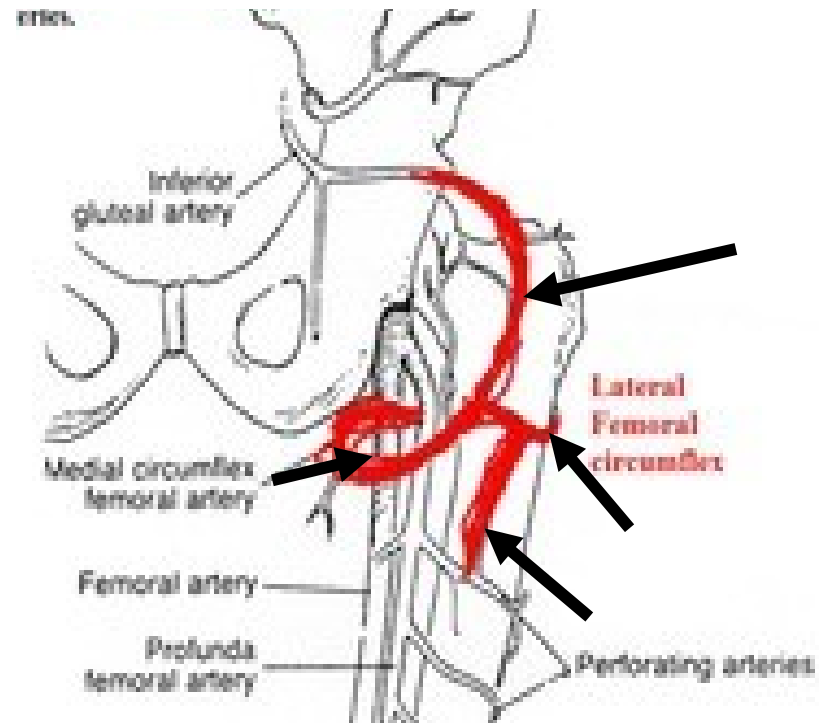


Arterial Anastomosis in the Gluteal Region

I. Cruciate Anastomosis:

- in back of thigh bet. Quadratus femoris & adductor magnus, level of lesser trochanter)

1. Transverse br. Of med. & lat. Circumflex f. a.
2. Descending br. Of inf. Gluteal a.
3. Ascending br. From 1st perforating a.

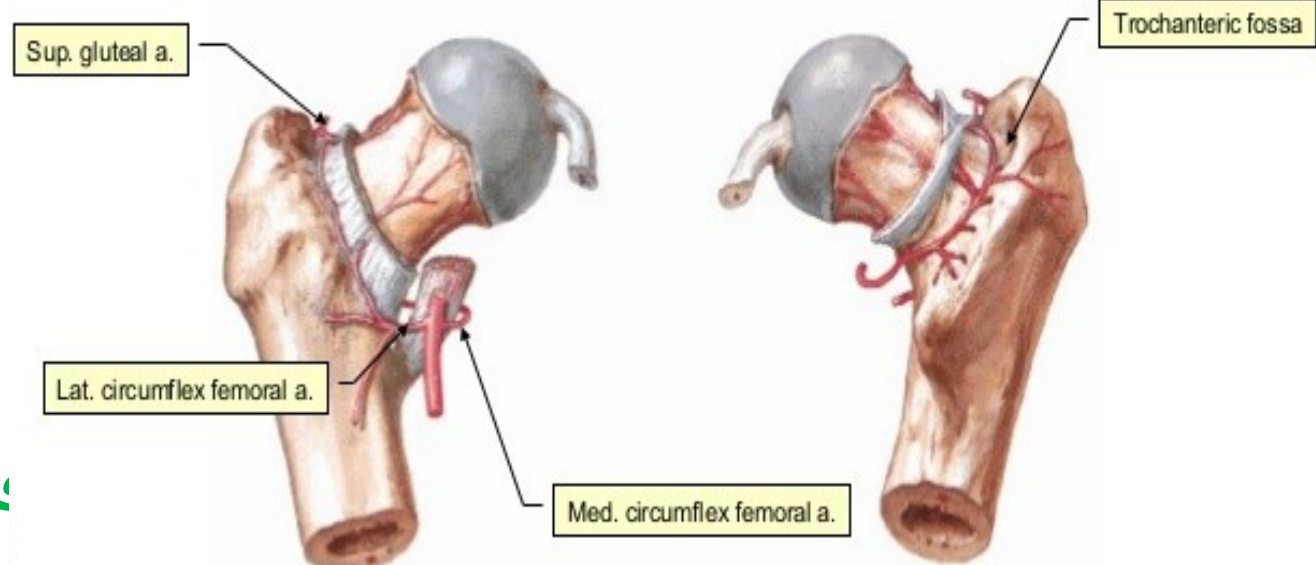


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- **II. Trochanteric Anastomosis (main supply of the head of femur)**, in trochanteric fossa:

1. Ascending br. Of lateral & **med. Circumflex femoral a.**
2. Br. From **sup.** & inf. Gluteal a.

P.S.: Both (Cruciate & trochanteric #) are connection between internal iliac & femoral arteries



Boundaries of Popliteal fossa

❖ **Superolateral:**

Biceps femoris.

❖ **Superomedial:**

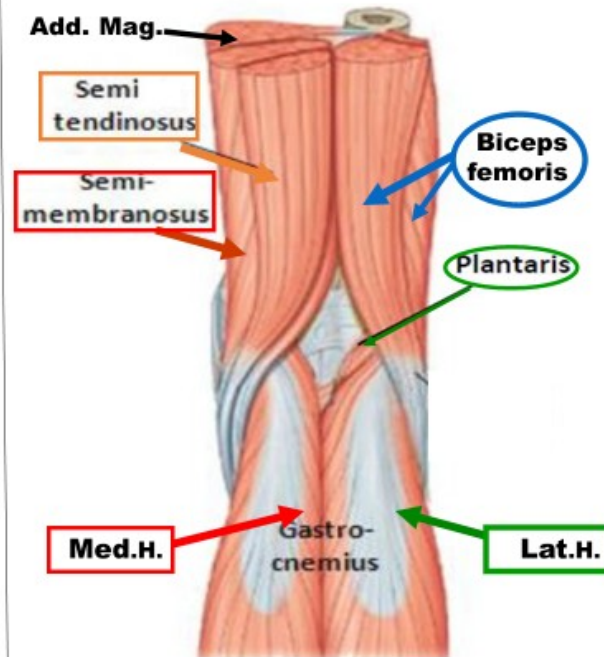
Semitendinosus &
Semimembranosus
supplemented by
sartorius, gracilis
& **add. magnus.**

❖ **Inferolateral:**

Lateral head of
gastrocnemius
supplemented by **plantaris.**

❖ **Inferomedial:**

Medial head of
gastrocnemius.



Contents of popliteal fossa

A-Vessles

1-Popliteal artery and its branches.

2-Popliteal vein and its tributaries.

B-Nerves

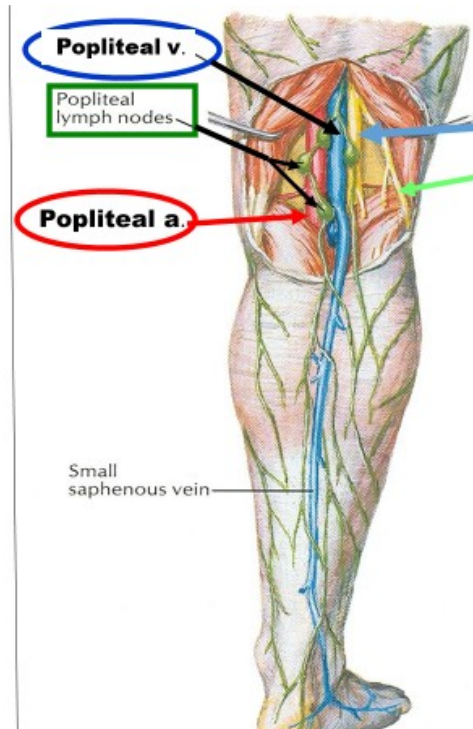
Two terminal brs. Of Sciatic.

- Tibial nerve
- Common peroneal N.

Post. Cut. N. of thigh.

C-Popliteal lymph nodes.

D-Amount of fat.



Common peroneal nerve



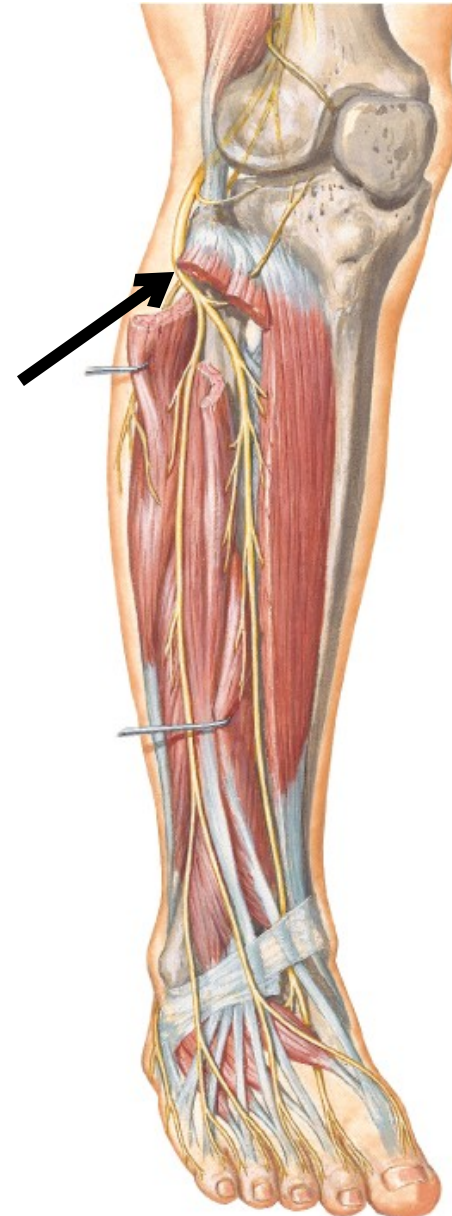
- ❑ Passes from **superior** angle of fossa close to **medial side of biceps femoris** to lateral angle of fossa
- ❑ Passes **behind** head of fibula
- ❑ Curves **around neck of fibula**, ends in peroneus longus by dividing into

Superficial and deep peroneal

Branches:

1- Sural communicating nerve

2- Lateral cutaneous nerve of calf



Tibial nerve



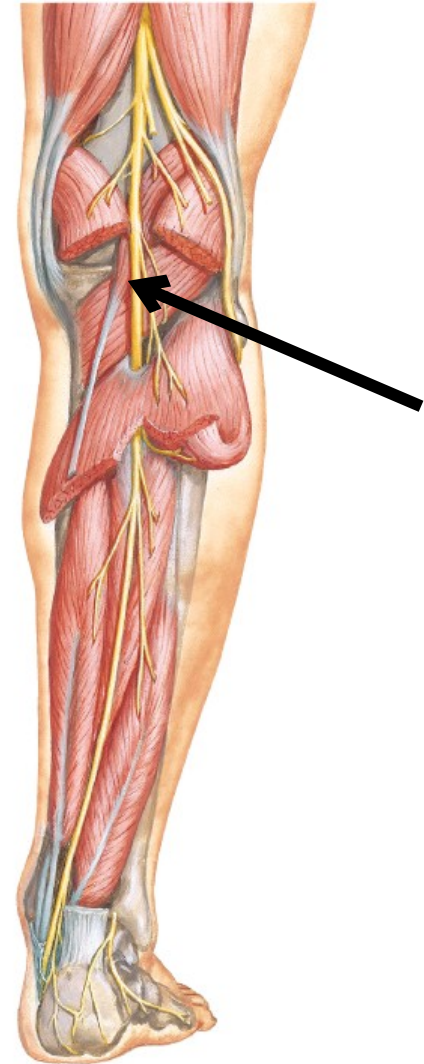
- ❑ Passes anterior to arch of soleus to back of leg

Branches

1-Sural nerve : passes between 2 heads of gastrocnemius , accompanied by **small sphenous vein**
Supply lower third of posterlateral of leg

2- Superior and inferior medial genicular

3- Muscular branches



Movements of hip joint

Movement	Main muscles
1) Flexion	Muscles which lie anterior to hip joint Psoas major & iliacus (Iliopsoas) □ most important + sartorius, rectus femoris & pectineus
2) Extension	Muscle at back of hip+ Muscles at back of thigh Gluteus maximus + hamstrings
3) Abduction	Muscles on lateral aspect of hip Gluteus medius& minimus + sartorius & tensor fasciae latae
4) Adduction	Muscles on medial aspect of thigh (adductors) Adductors longus, brevis & magnus + gracilis & pectineus
5) Medial rotation	Anterior fibers of glutei medius & minimus + adductors
6) Lateral rotation	6 lat rotators + gluteus maximus

Movements of knee joint

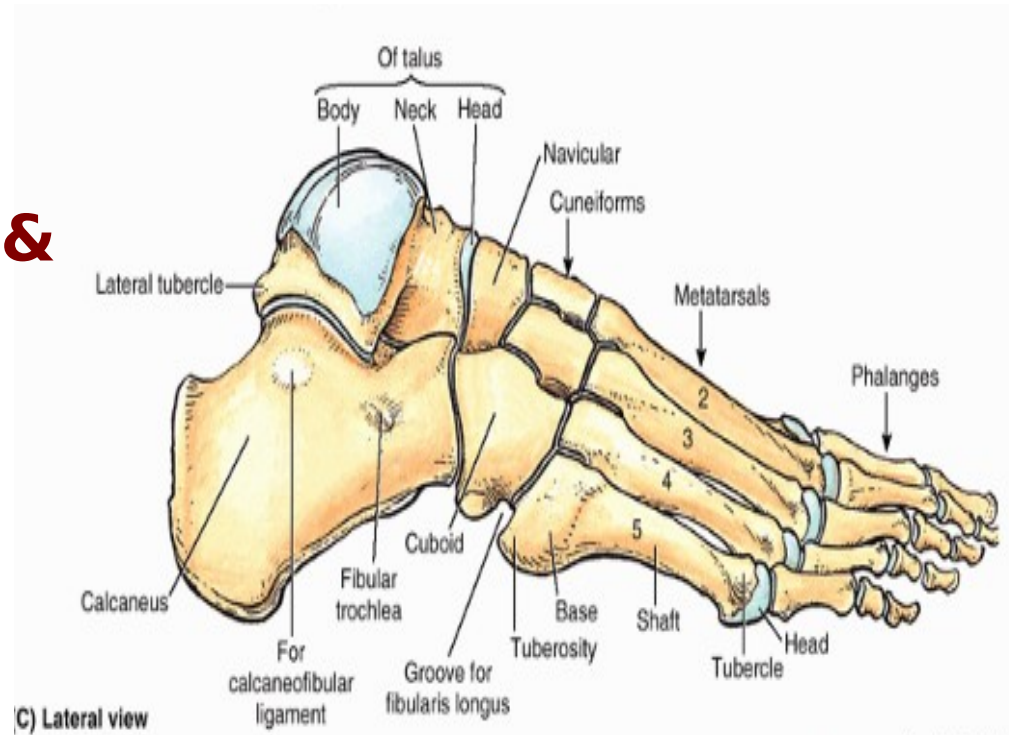
1. Flexion □ hamstrings + popliteus, sartorius & gracilis

(with foot on the ground □ gastrocnemius & plantaris)

2. Extension □ quadriceps femoris + tensor fascialatae

Talocalcaneonavicular joint

- **Movement:**
- **Inversion of foot** □ **by tibialis anterior & tibialis posterior**
- **Eversion of foot** □ **peroneus longus, brevis & tertius**



Ankle Joint

Movements:

- 1) Dorsiflexion:** done by muscles of the **anterior** compartment of leg
- 2) Plantar flexion:** done by muscles of the **posterior & lateral** compartments of leg.

Thank You